

What is claimed is:

1. A variable tuning antenna comprising:

a radiation element; and

a tuning circuit connected to the radiation element  
5 in series, the tuning circuit comprising a first inductance  
element and a parallel circuit which is connected to the  
first inductance element in series, the parallel circuit  
comprising a second inductance element and a variable  
capacitance element connected to each other in parallel,

10 wherein the tuning circuit is set so that a  
combined reactance of the radiation element and the first  
inductance element and a combined reactance of the parallel  
circuit can be canceled by each other, and the parallel  
circuit does not resonate in a desired receiving frequency  
15 band, and

wherein the tuning circuit is formed so as to be  
tunable in the desired frequency band by varying the  
capacitance of the variable capacitance element.

2. The variable tuning antenna according to claim  
20 1, wherein the variable capacitance element comprises two  
variable capacitance diodes, the two variable capacitance  
diodes being connected in series in reverse polarity, and  
having a terminal of a control voltage connected to a  
connecting part of the two variable capacitance diodes.

25 3. The variable tuning antenna according to claim  
1, wherein the radiation element comprises a first antenna  
element and a second antenna element connected to each

other electrically in series, the first antenna element and the second antenna element being formed in an electric length so as to resonate at a frequency within the desired frequency band by the total length, and so as to resonate  
5 at a first frequency band of a wide band in the desired frequency band with the tuning circuit, and so as to resonate at a second frequency band by only the first antenna element.

4. The antenna according to claim 3, wherein the  
10 first frequency band is a frequency band of a digital TV.

5. A portable wireless device comprising:

a transmitting/receiving circuit;

a casing surrounding the transmitting/receiving circuit;

15 a feeding part located near to the casing and connected to the transmitting/receiving circuit electrically;

a variable tuning antenna comprising a tuning circuit and a radiation element which are connected to the  
20 feeding part; and

a third antenna element connected to the feeding part,

wherein the variable tuning antenna comprises any one of the antenna defined in claims 1 to 4, and the third  
25 antenna element comprises an antenna resonating at a third frequency band different from that of the variable tuning antenna, so that two frequency bands of a first frequency

band of a wide band obtained by the variable tuning antenna and the third frequency band can be transmitted and received.

6. The portable wireless device according to claim  
5 5, wherein the radiation element comprises a first antenna element and a second antenna element connected to each other electrically in series, and the second antenna element of the radiation element is formed to be extended out of the casing and retracted to the casing; and

10 wherein when the second antenna element is extended out of the casing, the second antenna element is connected to the feeding part through the tuning circuit of the variable tuning antenna to resonate at the first frequency band and when the first antenna element is retracted to the  
15 casing, the first antenna element is connected to the feeding part directly.

7. The portable wireless device according to claim  
6, wherein the first antenna element and the third antenna element are formed in an electrical length so as to  
20 resonate at the same frequency band and the first antenna element and the third antenna element are adjusted so as to strengthen radio waves transmitted and received in phases, each other.